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The Impact of the Financial Crisis on Supply-Chain Financing

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Trade credit is an important source of financing for firms in emerging markets. In this note, we identify the firm and market characteristics associated with the extension of supplier financing. We find that firms that operate in more competitive markets and that are less credit constrained are more likely to offer trade credit to their customers. We also find that firms operating in a competitive market were more likely to increase the volume of goods sold on credit during the crisis. Finally, we show that in countries hit hardest by the crisis, firms under competitive pressure were relatively more likely to extend trade credit, which might suggest an additional financial burden for some firms.

Introduction

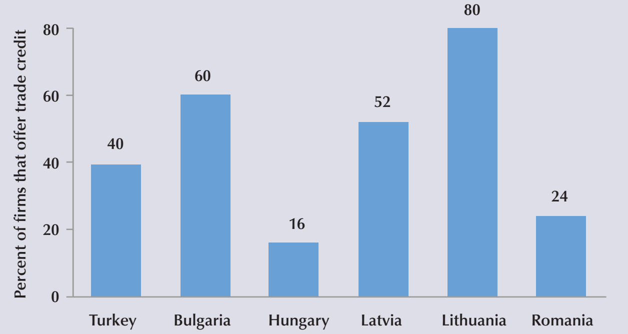
Supply-chain financing is an important source of funds for both small and large firms around the world. The financial crisis, however, brought about significant firm and market-level disruptions, which were likely to impact the decision to offer inter-firm financing. This note uses data from the World Bank's Financial Crisis Survey (FCS), which extends the Enterprise Survey (ES) database to create a panel of 1,686 firms in Bulgaria, Hungary, Latvia, Lithuania, Romania, and Turkey[1] in 2007 and 2009. The data provide novel evidence that the degree to which market competition and liquidity affected a firm's decision to extend trade credit in 2009 varied with the country-level severity of the crisis. We focus on two key measures of supply-chain financing: first, whether the firm extended trade credit to its customers, and second, a unique and timely variable of whether the firm increased, maintained, or decreased the volume of goods sold on trade credit during the crisis.

Previous literature on supply-chain financing shows a relationship with the market structure of the output market: firms in competitive markets are significantly more likely to extend trade credit as a means of attracting new customers and maintaining the loyalty of existing ones. The literature also examines how the capital structure of a firm impacts its decision to extend trade credit to its customers; for instance, firms with access to credit from banks or their own suppliers extend a greater amount of credit to their customers.[2] A related literature shows that during periods of contractions in bank credit, buyers might depend more on trade credit for short-term financing, and this may be especially true for small firms.[3]

Firms that extend trade credit are larger, centrally located, and export-oriented

In 2009, 43 percent of firms reported extending trade credit to their customers, with an econometrically significant variation across countries. In Lithuania, 80

Figure 1 Extension of trade credit, by country



Sources: Financial Crisis Survey/Enterprise Surveys.

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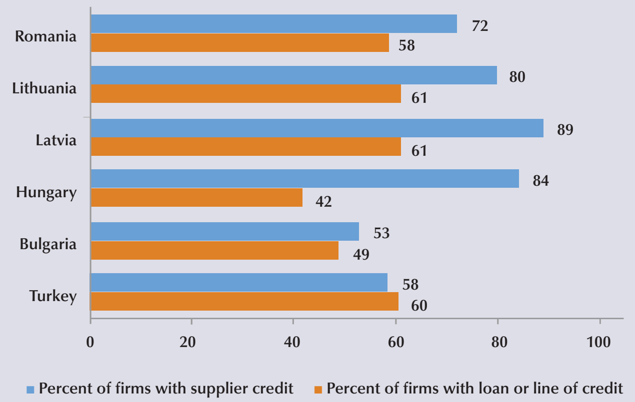
Figure 2 Access to bank and supplier financing



Source: Enterprise Surveys.

percent of firms reported extending trade credit, while the figure was only 16 percent among Hungarian firms (figure 1). Examining firm characteristics, 41 percent of small firms extend trade credit, compared to 44 percent of large- and medium-sized firms. In addition, 49 percent of exporters offer trade credit, compared to 40 percent of non-exporting firms. Among firms located in a capital city, 49 percent reported extending trade credit to their customers, contrasted with 41 percent in the subsample of firms that are not located in a capital city. Firms that export directly or indirectly, and firms located in a capital city, are more likely to offer trade credit even when accounting for firm, sector, and country-level differences.[4]

Competitive and innovative firms were more likely to extend trade credit

The offer of trade credit is often viewed as a competitive gesture, a way for firms to distinguish themselves from their competitors. Similarly, innovative firms looking to expand into new markets may also regard trade credit as a useful device for luring new customers away from their existing suppliers. Across the sample, approximately 41 percent of firms operated in a competitive market.[5] Innovative firms, defined as those who introduced a new product or service in the 2005-2007 period, accounted for 52 percent of the sample.

A significant relationship between the competitive structure of the output market and the extension of trade credit is found in our sample during the crisis period, similar to the findings in other literature during non-crisis periods. Innovative firms and firms that operate in a competitive market were significantly more likely to offer trade credit to their customers than firms that did not innovate or firms that did not face stiff competition from their competitors. To summarize, 48 percent of competitive firms offered trade credit during the crisis, while only 40 percent of non-competitive firms offered trade credit. The contrast is even starker for innovative firms: 51 percent of innovative firms extended trade credit, while only 34 percent of non-innovative firms extended trade credit.

The relationship between competition/innovation and the extension of trade credit holds even when accounting for basic firm characteristics such as age, size, export orientation, sector, and country, as well as use of bank and supplier-based finance. This suggests that even during a crisis, competitive firms in particular use trade credit as a means to attract new customers and maintain existing customers, specifically ones with strong preferences for delayed input payments.[6]

Less financially constrained firms were more likely to extend trade credit

Given that the extension of trade credit implies a delay in output payments with nontrivial consequences on a firm's liquidity, it follows that financial constraints affect a firm's decision to extend trade credit. In 2007, 57 percent of firms reported having a loan or line of credit from a financial institution, with significant variations across countries (figure 2). Just as they offer trade credit to their customers, firms may turn to their own suppliers for extensions of trade credit in order to provide liquidity, establishing a system of supply-chain financing. Approximately 71 percent of firms reported using supplier credit in 2007, a figure which, again, varies among the countries in our sample (figure 2). Although Hungary has the lowest rate of formal credit users, it has the second highest rate of firms using supplier credit, which might support prior evidence that firms turn to supplier credit when formal credit (which is generally cheaper) is not available.

Firms in our sample that had loans or a line of credit from a financial institution in 2007 were significantly more likely to extend trade credit in 2009.

Firms in our sample that had loans or a line of credit from a financial institution in 2007 were significantly more likely to extend trade credit in 2009. Among firms that had a loan or line of credit in 2007, 48 percent offered trade credit, compared to 37 percent among those that did not have a loan or line of credit. The positive association between access to finance and trade credit holds even when differences in firm, sector, and country characteristics, among others, are factored in.[8]

Firms more affected by the crisis are more likely to offer trade credit

The survey offers a unique opportunity to explore the relationship between the impact of the crisis and the extension of trade credit. Overwhelmingly, firms reported that the financial crisis impacted their establishment. Firms that were impacted by the crisis, and specifically firms that reported the main impact of the crisis was reduced access to credit, were significantly more likely to report extending trade credit. Also notable is that among firms that reported the main effect of the crisis to be increased input costs, only 31 percent extend trade credit, compared to 45 percent of firms who reported another main effect. Yet, the strongest difference is among firms that report plans to reduce their workforce: in this subsample, 56 percent of firms extend trade credit, compared to 39 percent among firms who do not plan to reduce the number of full-time employees in the next six months (figure 3). This difference is significant even after controlling for firm size, sector, competition, and other characteristics.[8]

Competitive and innovative firms were more likely to extend credit in severe crises

To explain why the extension of trade credit might be associated with higher firm vulnerability, we examine the impact of the crisis at the country level. We find that the degree to which a competitive market is associated with the extension of trade credit varies with the relative severity of the crisis in a given country. Using a country-level indicator of the severity of the financial crisis, there is strong evidence that a firm operating in a relatively more competitive environment is more likely to extend trade credit, and this is especially so in countries more severely affected by the crisis. The same applies for innovative firms: relative to non-innovating firms, an innovating firm is more likely to extend trade credit, and this is especially so in countries hit harder by the crisis.[9] Our results suggest that financing the extension of trade credit during the crisis might have put additional financial pressure on firms that had become credit constrained themselves.

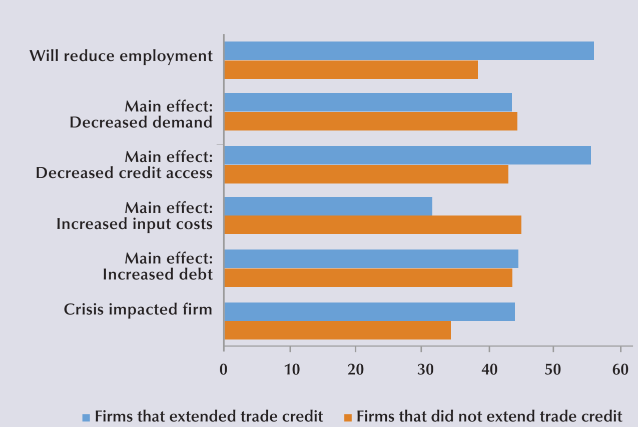
Changes in the extension of trade credit

Finally, we examine expected changes in the extension of trade credit. Across countries, we find that almost half the firms that extended trade credit prior to the crisis maintained a steady extension of credit during the crisis, while an almost even percentage report a decrease or increase in the volume of goods sold on credit (29 percent versus 23 percent, respectively).[10]

Hungarian firms experienced a comparatively large contraction in trade credit offerings, and only 3 percent of firms reported an increase in the volume of goods offered on trade credit. The situation was notably different in Lithuania and Romania, where more than 40 percent of firms reported increases in the volume of goods sold on trade credit (figure 4).

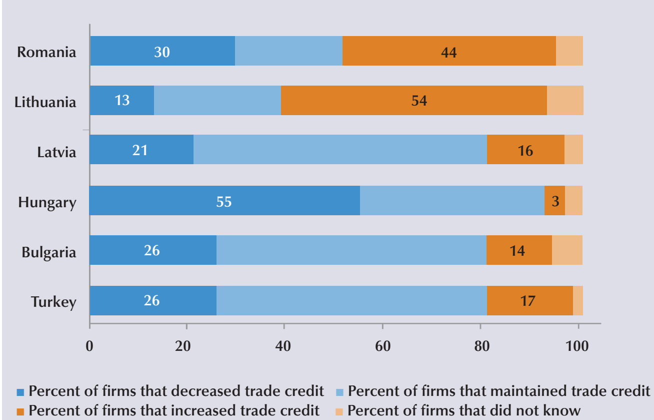
When compared to firms that experienced a decrease in sales, or maintained sales, during the past year, the subsample of firms that had an increase of sales reported heavier use of trade credit. The positive relationship between strong past sales and an increase in trade credit is maintained when controlling for firm-level characteristics. Future predictions of sales were also significantly associated with whether or not a firm increased or decreased sales on credit. Firms with positive future outlooks on sales

Figure 3 Impact of the financial crisis



Sources: Financial Crisis Survey/Enterprise Surveys.

Figure 4 Changes in the extension of trade credit during the financial crisis



Sources: Financial Crisis Survey/Enterprise Surveys.

were more likely to have recently increased the volume of goods sold on trade credit.[11]

During the crisis, firms in competitive markets continued to extend trade credit, which might have increased their financial vulnerability

Supplier financing is a critical source of financing for firms in emerging markets, yet the determinants of the extension of trade credit are not well understood. First, we identify the firm and market characteristics associated with the extension of supplier financing. We find that firms that operated in a competitive market or recently innovated are significantly more likely to offer trade credit to their customers, suggesting that supplier financing is often used as a competitive gesture. In addition, firms with greater liquidity to finance the extension of credit, measured as access to a line of credit or credit from their own suppliers, are more likely to extend credit. Second, we examine the impact of the financial crisis on supply-chain financing decisions and find that firms that operated in a competitive market are also more likely to increase the volume of goods sold during the crisis. Third, we study the heterogeneous effects of trade credit and find that in countries hit harder by the crisis, firms in competitive markets are more likely to extend credit than firms in less competitive markets. Overall, these results suggest an additional burden on firms in competitive markets during the crisis, which might have increased their financial vulnerability.

Notes

1. The sample of firms from Turkey covers only the manufacturing sector.
2. For example, see Petersen and Rajan 1997; McMillan and Woodruff 1999; Fisman and Raturi 2004; Cull, Xu, and Zhu 2007; Burkart, Ellingsen, and Giannetti 2009; and Fabbri and Klapper 2008.
3. For example, see Calomiris, Himmelberg, and Wachtel 1995; and Love, Preve, and Sartia-Allende 2007.
4. This analysis is based on a logit regression that explains whether a firm offers trade credit based on the firm's age (log years since foundation), size (small, medium, or large), ownership (foreign, state, or neither), location (in capital city or not), export orientation (whether or not the firm exports directly or indirectly), country, and sector. All of the explanatory variables are taken from the 2007 survey, while the explained variable is from the 2009 survey which allows for the isolation of cause and effect. This will henceforth be referred to as the "standard model." All results are available upon request.
5. Firms operating in a competitive market are defined as those who reported in 2007 that domestic and/or foreign competitors had a "very important" effect on the firm's production cost and/or new product development.
6. Based on the standard model, with additional controls for the use of supplier credit and use of bank financing (performed separately).
7. Based on the standard model, with additional controls for innovativeness and competitiveness (performed separately).
8. Based on the standard model with additional crisis-related variables (which are not lagged).
9. Based on the standard model, with an additional interaction variable between the competitiveness/innovativeness of the firm and the country-level crisis turbulence variable.
10. This question was only asked to firms that reported that they currently offered trade credit (43 percent of the sample).
11. Based on an ordered logit regression with the controls from the standard model, plus controls for recent sales trends. In the ordered logit regression, "decreasing trade credit" is given a value of 0, "maintained" a value of 1, and "increased" a value of 2.

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